OAK RIDGE NATIONAL LABORATORY
FY 2002 ENVIRONMENTAL, SAFETY, HEALTH, QUALITY, AND INFRASTRUCTURE (ESHQ&I) BUDGET FORMULATION PLAN

FACILITY ESHQ&I NARRATIVE SUMMARY

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Contents

I. Background 1
II. Summary 2
III. ESHQ&I Management Plan and Budget Formulation Plan Process 3
A. Laboratory Overhead and Space Charge Budget Request 4
B. Landlord Capital Funding Request 4
C. ESHQ&I Field Work Proposals 4
IV. Risk Ranking and Funding Allocation Process 4
V. FY 2000 Work Plan ESHQ&I Commitments 5
A. Major Planning Assumptions 5
B. Core ADS Milestones and Success Indicators 5
C. Target Milestones and Abatement Activities (FY 2000 and FY 2001 Commitments Progress) 7
D. Unfunded Compliance Liabilities with Identified Mitigated Actions 12
VI. FY 2000 ESHQ&I Key Management Issues 18
VII. Budget Analysis Support Information 20
A. Major Planning Assumptions 20
B. Funding Bases 21
C. FY 2000 ESHQ&I Indirect Budget Summary 21
D. ESHQ&I Direct Budget Summary 22
E. Impact of Potential Budget Reductions for ESH&Q Tasks 30
VIII. Conclusions 31

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I. Background

The environmental, safety, and health (ES&H) mission of the Oak Ridge National Laboratory (ORNL) is to conduct research and development (R&D) and operations in a manner that protects the environment, staff, and public, while allowing ORNL to continue to carry out world-class research in a cost-effective, competitive manner. ORNL is operated by the Lockheed Martin Energy Research (LMER) Corporation under Department of Energy-LMER Management Contract DE-AC05-96OR22464.

ORNL's Fiscal Year (FY) 2002 ESHQ&I Budget Formulation Plan was developed in accordance with guidance in the Department of Energy (DOE) *Environment, Safety, and Health Guidance for Fiscal Year 2002 Budget Formulation and Execution*, dated January 2000. It identifies the ESHQ&I activities considered necessary at ORNL to ensure the health and safety of employees and the public; protection of the environment; and compliance with applicable laws, regulations, DOE policies and orders, and other ESHQ&I requirements while carrying out the site's missions and planning for ORNL infrastructure needs which support R&D as well as ESH&Q. This plan was developed using risk-based planning and priority-setting methodologies to (1) establish and communicate ESHQ&I expectations to all stakeholders, (2) support the development of Departmental budgets and secure funding for ESHQ&I programs and activities, (3) support the integration of ESHQ&I principles in site-wide work planning and execution, and (4) assess ESHQ&I performance and provide feedback to promote continuous improvement.

The plan has been derived from the various levels and systems of ORNL's organizational structure. ORNL's self-assessment programs and external assessments were key in identifying and characterizing ESHQ&I issues documented herein and on the submitted Activity Data Sheets (ADSs). The risk-based prioritization methodology used to develop this plan has been adopted by ORNL to prioritize overhead activities, landlord capital requirements, and ESHQ&I programmatic activities. Except for constraints associated with the various funding sources for ORNL activities, that priority-setting methodology is the basis for work planning and scheduling decisions for the site.

The ORNL Capital Asset Manager is responsible for the development and maintenance of a continuous integrated approach to ESHQ&I planning to ensure that risks and compliance requirements are recognized and considered in the planning and execution of all activities designed to carry out ORNL's missions.

II. Summary

The FY 2002 integrated ESHQ&I Budget Formulation Plan identifies the following summary data of project/activity information.

ES&H/Both (ES&H and Infrastructure)	140		
Core ADSs		19	
Compliance ADSs		20	
Funded			6
Unfunded			14
Improvement ADSs		101	
Funded			18
Unfunded			83
Indirect ADSs		20	
Funded			19
Unfunded			1
Direct ADSs		120	
Funded			24
Unfunded			96
Infrastructure Only	78		
Core ADSs		1	
Compliance ADSs		1	
Funded			1
Unfunded			0
Improvement ADSs		76	
Funded			13
Unfunded			63
Indirect ADSs		2	
Funded			1
Unfunded			1
Direct ADSs		76	
Funded			14
Unfunded			62
Total Open ADSs	218		

Total Funding Request (Open ADSs, OE-Operating Expense, CE-Capital Expense/General Plant Equipment, LI-Line Item)

ES&H/Both (ES&H and Infrastructure)

	OE*	CE	GPP	LI	Total
FY 2000	92,289	2,192	2,150	1,101	97,732
FY 2001	111,488	5,040	4,400	6,627	127,555
FY 2002	142,458	8,360	7,940	12,800	171,558
FY 2003	93,007	3,581	19,203	26,100	141,891
FY 2004	90,890	3,250	10,025	7,500	111,665
FY 2005	90,890	1,650	1,475	15,500	109,515
FY 2006	90,890	1,100	1,500	2,000	95,490
Total	$712,912	$25,173	$46,693	$71,628	$855,406

Infrastructure Only

	OE*	CE	GPP	LI	Total
FY 2000	829	1,108	2,300	0	4,237
FY 2001	1,695	2,013	4,950	0	8,658
FY 2002	2,162	5,361	4,293	0	11,816
FY 2003	936	2,247	8,550	3,000	14,733
FY 2004	944	260	520	13,000	14,724
FY 2005	952	260	0	4,000	5,212
FY 2006	960	260	0		1,220
Total	$ 8,478	$11,509	$20,613	$20,000	$60,600

*Includes OE requests from Field Work Proposals (FWPs).

III. ESHQ&I Management Plan and Budget Formulation Plan Process

ORNL is in the process of implementing an Integrated Safety Management System (ISMS) that is scheduled for Phase II Verification beginning March 2000. An ISMS Implementation Committee has been appointed and chartered by the ORNL Executive Committee to provide guidance and oversight of implementation. The ISMS Implementation Committee membership is comprised of senior management from each ORNL directorate and the DOE ORNL Site Office. In support of the establishment of an ISMS, a single ESHQ&I Management Plan process has been developed and implemented to provide a means for ORNL to document, prioritize, and report ESHQ&I budget information.

The integrated ESHQ&I Management Plan provides the capability to identify and track ESHQ&I projects and activities and their associated milestones and accomplishments. The plan documents identified risks, their impacts, and/or benefits. These risks and impacts provide the basis for the evaluation of projects and activities for resource allocation decisions. The plan is in a database

format which provides essential data reporting capabilities.

Requests for projects and activities with their estimated resource requirements, justifications based on risk and/or benefits, and proposed milestones are documented in the following systems for input into the ESHQ&I Management Plan Information System.

A. Laboratory Overhead and Space Charge Budget Request

The Laboratory Overhead and Space Charge Budget request is submitted annually by overhead offices and divisions through the Program Management Tracking System (PMTS) and is processed through the Corporate Information System. These requests are for funding that is allocated from an assessed overhead/space charge rate from programmatic funds (DOE projects) and work for others projects. The PMTS entries are designated as requests for one of the following: ESH&Q funding, infrastructure funding, both ESH&Q and infrastructure, or not applicable. Following entry into PMTS, each project is evaluated and risk ranked by the ORNL Risk Ranking Board. Unfunded requests are transferred to the ESHQ&I Management Plan Information System. Funded requests are combined into functional area ADSs (e.g., radiation protection, safety and health, plant and equipment, etc.).

B. Landlord Capital Funding Requests

ORNL divisions/offices/programs request Landlord Capital funds by submitting an ADS through the Web-based ESHQ&I Management Plan Information System. These requests are for general-purpose equipment (GPE), general plant projects (GPPs), and line item (LI) projects. Each request is designated as “infrastructure” or “both” if the activity is ESHQ&I related. The ORNL Risk Ranking Board evaluates each ADS and determines a risk ranking for funding allocation decisions. Landlord Capital requests are submitted through two FWPs (ERKCL01, “General Purpose Equipment,” and ERKCL02, “General Plant Projects”) and Line Item Construction Project Data Sheets. Allocated funding (funded projects) is identified in the execution years with backlog projects identified as unfunded in either execution years or out-years.

C. ESHQ&I Field Work Proposals

ORNL divisions/offices/programs may request direct funding from the DOE ORNL Landlord (Office of Basic Energy Sciences) for noncapital-related ESH&Q expense funding requirements. These requests are submitted on FWPs in PMTS, designated as ESHQ&I related, and transferred to the ESHQ&I Management Plan Information System. Each request is risk ranked by the ORNL Risk Ranking Board for resource allocation decisions. Alternative funding sources are considered in the event that noncapital-related compliance requests are identified on an FWP.

IV. Risk Ranking and Funding Allocation Process

A formal process is established to evaluate risk associated with designated Laboratory overhead, landlord capital requirements, line items, and other landlord FWP expense projects/activities. Each project/activity receives a risk score that is then submitted to management for further evaluation

and adjustment, if required, of risk scores. These scores are used as a factor in determining the allocation of available resources.

The risk ranking process flow includes:
- submittal of funding request documents,
- preliminary risk and scoring verification,
- risk scores by the Risk Ranking Board,
- funding and prioritization analysis,
- management review and adjustments,
- ORNL Operating Committee or Overhead Committee review and concurrence,
- ORNL Executive Committee approval, and
- DOE review and adjustments.

V. FY 2000 Work Plan ESHQ&I Commitments

A. Major Planning Assumptions

Organizational structure and business planning processes are now undergoing review and change at ORNL as a result of reengineering activities. However, this plan is based on the continuing operation of ORNL with the focus on integrating ESHQ&I within the core competencies of ORNL. The following core competencies are the planned future building blocks of ORNL:

- Energy Production and End-Use Technologies,
- Biological and Environmental Sciences and Technologies,
- Advanced Materials Synthesis Processing and Characterization,
- Neutron-Based Science and Technology,
- Emerging Competency of Oak Ridge Manufacturing Technologies,
- Emerging Competency of Computer Science and Advanced Computerization,
- Institutional Competency of Development and Operation of a National Research Facility,
- Institutional Competency of R&D Integration and Partnership,
- Institutional Competency of Technology Transfer, and
- Institutional Competency of Science Education.

A significant effort is made to ensure continued efficiency in ORNL's operations and services to promote the mission of ORNL. A list of specific standards for operation of ORNL facilities was developed as a function of "Work Smart Standards" identified under the necessary and sufficient (N&S) closure process. The N&S process was based on the process defined in Chapters I and II of the Department of Energy Closure Process for Necessary and Sufficient Sets of Standards (DOE M 450.3-1). The standards developed for ORNL facilities are referenced in the DOE-LMER contract, Section H.15(c).

B. Core ADS Milestones and Success Indicators

Currently performed ESHQ&I activities considered necessary by ORNL management to maintain current levels of ESHQ&I compliance or to prevent increases in current levels of ESHQ&I risks

have been identified as “core” activities. Two primary sets of core activities have been identified. The first set includes core activities within the ORNL ESHQ&I overhead divisions (functional area designations) with a Pool Identification (ID) of OH. The second set includes core activities within ORNL programmatic organizations (e.g., R&D divisions) directly funded by programmatic sponsors. All core activities are targeted functions at ORNL and have received funding within this plan to maintain their current level of compliance.

Overhead core functions have been identified either as functional area ADSs or specific ADSs for overhead functions. The following is a summary of the core functional areas.

Functional Area Health - funded activities for medical health include emergency health, physical/mental evaluations, medical treatment and triage, rehabilitation, medical records, and activities required by contract standards at ORNL.

Functional Areas Environmental Protection, Environmental Management, and Laboratory Waste Services - funded activities provide environmental management, environmental compliance, environmental sampling, and waste services. ORNL is obligated to comply with all applicable federal, state, and local environmental laws and regulations, and selected DOE orders. These functional areas have specific environmental oversight responsibilities for the DOE Oak Ridge Reservation area outside the site boundaries of the three developed sites.

Functional Area Radiation Protection - funded activities protect the ORNL site population from radiation and related contamination hazards that exist in the work environment. Major responsibilities include operation of an effective and efficient dose assessment program; health physics support for overhead divisions during off-shift hours and in emergencies; and oversight of health physics instruments, sealed sources, and X-ray–generating devices.

Functional Area Safety and Health Protection - funded activities to conduct periodic Occupational Safety and Health Administration (OSHA)-type inspections and provide consultation and guidance to all divisions in meeting OSHA regulations while maintaining a focus group knowledgeable in highly visible OSHA programs, provide direct day-to-day contact with research and service division personnel for hazard evaluation and planning, provide project-specific site characterization and support for construction and service contract activities, provide technical service support such as instrumentation and reporting, and provide hazardous materials management support.

Functional Area Laboratory Protection - funded activities to provide shift operations management support, emergency management, fire protection, nuclear materials control and accountability, and visitor services.

Functional Area Laboratory Logistical Services - funded activities are to provide a central point for interpretation and application of federal, state, and local regulations, and DOE orders concerning transportation of radioactive and hazardous materials and materials management.

Functional Area Nuclear Safety - funded activities to provide oversight of ORNL nuclear facility

activities and operations and to ensure that requirements of federal laws and applicable DOE Orders are complied with to protect the public, the workers, and the environment.

Functional Area Quality Services - funded activities are to provide quality assurance, quality engineering, and inspection services to support the overall mission of ORNL in accordance with the direction provided in DOE Order 5700.6C and 10 CFR 830.120 for Quality Assurance.

Functional Area Engineering - funded activities to support construction management and planning.

Functional Area Capital Asset Management - funded activities to support implementation of life cycle asset management for Laboratory infrastructure planning, budgeting, and management.

Functional Area Plant and Equipment - funded activities to support general and specialized maintenance projects.

Functional Area Integrated Safety Management - funded activities to support the implementation of Integrated Safety Management.

Functional Area Training - funded activities to support a compliance training organization.

Other ongoing overhead-funded activities include administration of the agreement-in-principles between the state of Tennessee and DOE (e.g., Tennessee Oversight Agreement/Health Studies Agreement) and other administrative support services.

The “Core” ADS identified as being funded from Pool DA identifies and documents division administration ESHQ&I functions and services within programmatic-funded organizations. The FY 2002 ESHQ&I Budget Formulation Plan identifies those programmatic organizations where pooled internal division overhead is used to provide ESHQ&I services for the divisions. Examples include the activities of a Division Safety Officer, Environmental Protection Officer, Waste Certification Officer, etc. Internal division administration may also include activities such as maintenance functions for division-managed facilities. Additionally, an ADS is submitted to provide accounting of funding and ESHQ&I services for the High Flux Isotope Reactor (HFIR) and is listed under Research Reactors (RR) as a Pool ID. The purpose of the ESHQ&I support from internal division pooled resources is to provide (1) a safe environment for the public and employees and (2) division resource control to ensure compliance with regulatory requirements.

C. Target Milestones and Abatement Activities (FY 2000 and FY 2001 Commitments Progress)

Funded compliance ADSs are those that identify additional corrective actions, activities, or programs over and above the current Core ESHQ&I programs that are required to improve facilities' state of compliance with all applicable ESHQ&I laws, regulations, agreements, and DOE orders. After compliance has been achieved by activities identified in the funded compliance ADSs, continuing activities and resources to maintain compliance will then be included in core

ESHQ&I functions at ORNL. Significant funded improvement ADSs supporting infrastructure activities do not contain an ESH&Q driver; however, they are critical to the ongoing mission of the Laboratory.

The current Secretarial Office responsible for Landlord activities at ORNL is Office of Science, Office of Basic Energy Sciences (Budget and Reporting Code KC0000000/Resource Structure Code WA0606). Prior to FY 1996, the Office of Multiprogram Energy Laboratories - Facilities Support (Budget and Reporting Code KG00000/Resource Structure Code YA0901) was responsible for Landlord activities. KG continues to fund line item Landlord projects. However, requests for FY 2000 and out-years for Landlord operating expense, capital equipment, and general plant projects are being submitted for KC funding allocations. The following is a summary of the funded compliance ADSs for milestone accomplishments, listed in total, adjusted, descending score order with a current status assessment.

The following are funded compliance activities with a commitment status for FY 2000 and FY 2001:

C97D0071 Fire Protection Systems Upgrade (KC-GPP)
This ADS provides for fire protection system upgrades for automatic preaction sprinkler system valves, automatic dry-pipe sprinkler system, fire alarm systems, and other supporting fire systems such as fire doors from Landlord GPP funding.

Status: $500K was funded to (1) upgrade the 4500N Wing 5 alarm system and connect it to the 4500N alarm system, (2) replace five dry-pipe sprinkler systems in the 7001 complex with wet-pipe systems, (3) replace two deluge valves in 5500 and make modifications between the sprinkler systems and fire door systems, and (4) replace a deluge valve that protects portions of Buildings 4501 and 4505. An additional $150K has been funded in FY 2000 to replace sprinkler system alarm valves in 3012 and the fire alarm panels in 3019. Although the systems are aging and becoming more failure prone, they are on a rigid inspection, testing, and maintenance schedule. Failure rates and types are recorded and accumulated. Should failure rates reach a "critical" level where negative impacts on people and property appear imminent, direct contact will be made with upper management to get funds for immediate action on an emergency basis. Routine fire protection engineering assessments, monthly building inspections, and frequency of alarms are other methods utilized to monitor systems reliability.

A99D0018 Fire Protection Systems Upgrade (FY 2001 KG LI)
This Landlord funded Line Item provides for upgrades to fire alarm systems, sprinkler system upgrades, centralization of alarm circuits, and replacement of deteriorating underground piping systems.

Status: Funding for this project is included in the President’s budget for FY 2001.

A99D0059 Shared Systems Computing Equipment for Separation
The equipment requested is to support the DOE-mandated separation of business systems shared between ORNL and LMES. This effort is required to assist the Laboratory in a smooth transition

during the contract separation planned for April 1, 2000. Shared systems are defined as any application, hardware, or data supporting both LMES and ORNL in business activities. If this work is not completed in an appropriate time frame, ORNL will fail to meet the DOE requirement for separation of shared systems and also fail to comply with expected independent reporting to DOE.

Status: Separation of shared systems is progressing on schedule.

C97D0125 CFC Phaseout - Clean Air Act Compliance (KC)
Replace air conditioning equipment which uses Class I ozone-depleting refrigerants [chlorofluorocarbons (CFCs)]. CFC refrigerants are recovered from the machines as they are replaced and reused in remaining operating units. Job scope includes removal and replacement of old units, electrical starters, and related electrical and piping tie-ins.

Status: Prior to and during FY 1999, 13 major chillers and 5 smaller CFC units have been replaced. Due to their location, the CFC chillers in the basement of 4500N, which are used as standby chillers, will not be replaced. Funding is planned in FY 2000 and FY 2001 to complete replacement of smaller CFC units.

A99D0028 Whole Body Counting Lab Liquid Nitrogen Tank
This project will procure and install a Liquid Nitrogen (LN_2) Fill System to supply LN_2 to the Whole Body Counting Laboratory germanium counters. The system includes: 1500-gallon LN_2 Tank, associated vacuum-jacketed supply lines, construction of a concrete pad to support the tank, and associated engineering design and labor charges.

Status: Procurement of the liquid nitrogen tank has been initiated.

P98D0022 Fire Sprinkler Piping Maintenance - OE
The Fire Protection Piping project includes backflushing Five ORNL buildings (3012, 3019, 3095, 6001, and 7013) aged automatic dry-pipe sprinkler systems.

Over a period of time, scale forms inside the piping of a dry-pipe system and must be removed to prevent plugging of piping and/or sprinklers. Specific procedures are in place for backflushing and must be followed to prevent physical damage to dry--pipe sprinklers system components. These backflushing operations are very manpower intensive, time consuming, and occasionally require replacement of pipe and fittings. Many of the dry-pipe sprinkler systems at ORNL were installed in the 1950s and 1960s and are in desperate need of backflushing.

Status: These backflushing activities are scheduled to be accomplished during a 3-year period (beginning in FY 2000) with $20K allocated each year from space charge funds.

P98D0026 ORNL Facility Asbestos Survey
Approximately 60% of the facilities located at ORNL have been surveyed for the identification of asbestos. This program will provide funding to complete the Asbestos Surveys for the remaining

40% of the buildings within the ORNL Facility.

Status: This activity is funded at $200K from Laboratory overhead in FY 2000. Approximately $100K will be required in FY 2001 to complete the survey.

The following are significant funded improvement activities with a commitment status for FY 2000 and FY 2001:

S97D0029 Roofing Replacement, ORNL (LI)
The project described involves the replacement of deteriorated roofs on buildings and facilities throughout the ORNL complex. Most of the roofs at the complex have been in service for over 30 years, and because of deterioration, they have developed numerous leaks. In many instances, these leaks have adversely affected equipment, records, and research, as well as the health and safety of personnel working within the facilities.

The scope of this project includes the replacement of built-up roofing, including removal and disposal of existing membrane and insulation, inspection and repair of damaged deck, and installation of new insulation and membrane with associated flashing and trim.

Status: In FY 1999, 28 buildings totaling approximately 452,000 ft^2 were completed. To date, 41 buildings totaling 887,000 ft^2 have been completed.

S97D0021 Reservoir No. 1
This project will construct a new 1.5-million-gallon steel water reservoir at a location east of the existing 0902 concrete reservoir. The addition of this reservoir structure will improve the reliability of the ORNL water distribution system by adding the redundancy needed to allow major maintenance work to be performed on the existing 50-year-old concrete structure. The old reservoir cannot be taken out of service for extended periods without impacting day-to-day activities in Bethel Valley facilities. ORNL relies on a gravity-fed water system with the reservoir system providing the necessary "head" to maintain the required water pressure throughout the plant. If the existing concrete reservoir were taken off-line and the head provided by the reservoir structures at the Water Treatment Plant north of Y-12 were relied upon, the necessary system pressures required by fire protection in many of the Bethel Valley facilities could not be maintained. The addition of a new reservoir will allow pressures to be maintained while repairing the existing concrete structure.

Of added benefit, the new reservoir will increase the Laboratory's on-site water reserve to 7.5 million gallons. On normal summer days, this represents less than a 2-day supply of water, which is believed to be sufficient to provide the cushion necessary if normal water supplies from the Water Treatment Plant are interrupted. The Water Treatment Plant is being turned over to the City of Oak Ridge in April 2000, and while no major changes in day-to-day operations at the plant are expected, the transition does represent a possible shift in operating philosophy. When DOE operated the facility, the emphasis was to provide a reliable and safe supply of water to Y-12 and

X-10 as well as to the City of Oak Ridge. City of Oak Ridge management at the water plant will no doubt place their needs ahead of those of DOE, leaving DOE facilities more vulnerable to possible water outages. The addition of another 1.5 million gallons of water reserves at the Laboratory will help prevent such outages.

Status: The design/build specification has been completed and will be advertised for bids in April 2000.

A99D0048 HFIR Cooling Tower
The HFIR Secondary Coolant System is composed of the secondary coolant piping, pumps, valves, cooling tower, and its control system. The components of the secondary coolant system are over 33 years old and are approaching their end of life. Recent inspection of the wooden cooling tower internal structural components shows extensive degradation. Additionally, recent ORNL fire protection inspections of the cooling tower fire protection system found leaks, which indicate that a complete replacement is needed. The remaining life for the HFIR cooling tower is estimated at 3 to 5 years.

This GPP request is for the demolition and replacement of the HFIR cooling tower structure, including the piping to the primary pump flanges, on the existing basin. Updated flow controls for the new tower will also be installed. No secondary piping replacement is included in this project.

Status: The construction specification is out for bid with bid opening scheduled for April 4, 2000.

C97D0106 Electrical Upgrade
This project will rebuild designated overhead feeders, upgrade building electrical service entrances, and improve substation improvements for transformer switchgear and transformers.

Status: FY 2000 funding has been received for this project. The Expert Independent Review for the project has been drafted and comments submitted. Personnel are currently awaiting approval to begin work on the project.

A99D0033 Primary Substation SF6 Breakers
This project will replace five existing 161-kV oil circuit breakers (OCBs) with five new surplus SF6 insulated breakers in the ORNL Primary Substation. The breakers include two incoming line breakers (954 and 964) and three power transformer primary breakers (874, 884, and 894). The work will include removal, transport, and disposition of the oil from the old breakers, removal of the existing OCBs and associated buswork, installation of new concrete pads, installation of the new SF6 breakers, reinstallation of associated buswork connections, and installation of new control cables to the existing 0901 control building. The installation of the power transformer No. 3 breaker will require the removal of an existing switch support structure and foundations and the relocation of existing metering current transformers.

Status: The construction specification is being developed and will be issued for bid in April 2000.

S97D0055
250,000-Gallon Steel Fuel Oil Storage Tank
This project will construct a 250,000-gallon prefabricated steel storage tank and secondary containment structure adjacent to the ORNL Steam Plant. This tank will be used to store fuel oil, which is used as an emergency fuel source for the generation of steam at the facility. Associated fuel oil transfer lines and pumps used to move the fuel from the tank into the steam plant will be included in the project, as will a fire suppression system for the tank and its equipment.

Status: Construction of this project is approximately 50% complete.

A98D0015 Engineering Equipment Replacement
This project provides for the replacement of the antiquated drawing reproduction Xerox copier 5080 and printer OCÉ 3450 with OCÉ 9877 Reproduction/Scan Station, OCÉ 9455 Plotter/ Printer, and OCÉ 3000 Aperture Card Reader/Scanner. ORNL Engineering Services is chartered to support the ORNL Engineering Division and the entire Laboratory by providing access to and retrieval of engineering drawings, aperture cards, vendor and manufacturing information files, and historical documents created since 1943. ORNL Engineering staff, other ORNL personnel, and subcontractors must have continual access to the drawings and all revisions and project files to perform their work. Existing equipment does not meet the needs of the users. The equipment is obsolete, and parts are not available for repairs. The cost for additional repairs would be greater than the value of the equipment.

Status: This equipment has been installed and is in operation.

D. Unfunded Compliance Liabilities with Identified Mitigated Actions

The following ADSs have unfunded compliance requirements associated with them. Actions to mitigate risk are noted for each ADS. There are no FY 2000 unfunded requests. The following are identified for out-year funding.

P98D0019 ORNL S&H - Building Electrical System Upgrade (KC-OE)
ORNL Facilities' Condition Assessment Survey identified legacy vulnerabilities from fire and electrical shock hazards principally due to aging facilities and installations which do not meet the National Electrical Code. Many of these were categorized as Urgency Repair Code No. 1 - asset condition critical, Urgency Repair Code No. 2 - asset condition serious, or Urgency Repair Code No. 3 - asset condition degrades. Money is not available to address large electrical safety infrastructure issues under current funding programs. Therefore, a building electrical system upgrade proposal is logical and cost effective. It is essential that these needs be identified within the budgeting process. The primary areas requiring this enhanced support are (1) wiring and panel board replacement, (2) circuit identification and removal of abandoned services, (3) upgrade of wiring to meet the National Electrical Code, and (4) motor control center upgrades.

Mitigating Actions: Electrical workers will follow safety-related work practices when performing electrical work on aging or potentially defective equipment. Facility maintenance personnel recognize that much of the electrical system and associated electrical apparatus located at the

Laboratory is old and requires a higher level of care. Employees working on the equipment do so with a heightened sense of awareness and look for problems they would not normally be concerned with on newer equipment. Deficiencies found to be immediately dangerous to safety and health or property will be corrected with available maintenance funds.

A99D0148 Support Services Facility (LI)
This project will involve the deactivation of Quonset hut type structures (Buildings 2000 and 2001) built in the 1940s that house respirator test facilities, cylinder and valve test facilities, radiography, nondestructive examination services, the HEPA filter test facility, ORNL assessment and audit functions, maintenance support services, and the design and construction of a new multipurpose facility containing test equipment areas, service and repair shops, maintenance areas, and office areas for associated personnel. This new facility will improve efficiency and safety of the previously stated service support functions, reduce and eliminate the ES&H exposure hazards, and reduce the maintenance costs associated with the continued occupancy of the existing obsolete and deteriorated facilities.

Mitigating Actions: Operations, other than the radiography vaults, are being relocated to other facilities in preparation for shutdown of Building 2000 in FY 2000. Efforts are also being made to find facilities suitable to relocate the few remaining activities in Building 2001 by the end of FY 2001.

C97D0081 Eyewash, Safety Shower, and Water System Upgrades (KC-GPP)
The scope of this activity includes the upgrade of water supply systems and encompasses the following:

1. Install safety showers and eye washes with potable water supply.
2. Replace piping and associated components used to supply and remove process water.
3. Replace piping and associated components used for heating.

This project includes the removal and replacement of any existing eyewash stations and safety showers in the laboratories and corridors of Wings 2 and 3 of the Central Research and Administration Building, 4500N, and safety showers and eyewash stations in 4501 and 4505. To meet OSHA standards, potable water headers will be installed to supply the water for the safety shower and eyewash stations.

Mitigating Actions: Portable eyewashes are being installed in these facilities until GPP funding becomes available for the new eyewash and safety shower systems.

AA0D0042 Update Nuclear Facility Drawings
This activity provides for the update of nuclear facility drawings required to define the design bases for safety. "As-built" drawings are required by the facility authorization basis documentation. Difficulties in controlling "as-built" drawings could have a serious operational impact on the facility operations, with the potential for a reportable occurrence. A coordinated program for periodic update of required drawings for these facilities is necessary to assure compliance with approved facility safety basis.

Mitigating Actions: Until funding allows a comprehensive upgrade of building drawings,

modifications to safety class/safety significant/selected defense in-depth systems will be done using red-lined/newly generated drawings, which satisfy Unreviewed Safety Question Determination/configuration control requirements.

A99D0063 Environmental Controls - I&C Calibration Facility
The Instrumentation & Controls Division (I&CD) Measurement and Test Equipment (M&TE) Calibration Facility and its equipment are used to accomplish two critical tasks at ORNL:

1. To provide special measurement services for ORNL R&D programs, and
2. To perform calibrations for M&TE used for ORNL R&D activities, facility operations, and environmental monitoring and control. These calibrations must be traceable to the National Institute of Standards and Technology (NIST).

This facility provides the required traceability for virtually all measurements of electrical and optical quantities, pressure, temperature, and flow (liquid and gas) made at ORNL to the national system of units maintained at NIST. This includes traceability for the secondary standards and instruments maintained by the I&C Division's Technical Support Section (TSS). TSS supports most of the instruments, both "off-the-shelf " and "custom made," which are used in R&D experiments throughout ORNL. It also maintains measurement and controls instruments and transducers which are used for environmental monitoring systems, facility operations and compliance systems, and for monitoring and controlling HFIR.

For traceability to have any real significance, however, the uncertainties along the chain of calibrations must be rigorously accounted for. Currently, established practice among the nation's standards laboratories is that an uncertainty or accuracy ratio of at least 1:4 must exist at each step in the calibration chain. Advances in measurement technology are making this increasingly difficult to demonstrate. Calibration accuracy requirements increase continuously as instrument technology improves. In addition, the increased emphasis on Quality Assurance at ORNL has increased both the number and quality of calibrations required.

A crucial need is a substantial improvement in the current calibration facility's environmental controls. As the precision and accuracy of measurements increases, so does the uncertainty due to fluctuations in the environmental conditions in which the measurements are made. Establishing and maintaining a constant environment is essential to achieving the measurement accuracy currently required at any national laboratory for standard comparisons and calibrations. The need for such accuracy levels can also be expected to increase significantly with the demands that will be placed on the facility by new, highly instrument-dependent programs such as the Spallation Neutron Source. With the exception of two "window type" air conditioners set into the east wall, the current facility, unlike almost every other calibration facility in existence, has no special environmental (temperature, humidity, dust, etc.) controls.

Mitigating Actions: Because the temperature and relative humidity in the current I&C Division Metrology Laboratory areas are very difficult to control, the environmental specifications for standards-in-use and Units Under Test must be considered for each activity and compared to the conditions in the laboratory at that particular time. The following practices are among those used to compensate: portable humidifiers, auxiliary air conditioning, and algorithms to normalize data.

P98D0007 ORNL H&S-Radiological/Toxicological Sabotage (KC-OE)
DOE Notice 5630.3A, "Protection of Departmental Facilities Against Radiological and Toxicological Sabotage," dated June 28, 1993, was made applicable to ORNL by inclusion of Oak Ridge Order 151.1, Rev. 1, dated September 30, 1996, into the baseline. It requires contractors to perform graded assessments of the risk due to sabotage with the level of hazards present in their facilities.

Mitigating Actions: At facilities where there are plans to modify current operations or significantly change the inventory of nuclear or hazardous materials that could cause potential adverse public health and safety impacts due to sabotage, the facility/program manager is required to provide funding for a radiological/toxicological sabotage assessment as part of the planning process. FWP ERKCL25 is submitted annually to request funding for this activity.

C98D0167 Cooling Tower Maintenance - ERKCL30 (KC-OE)
Cooling Towers 4511 and 6001 are critically degraded due to age and inadequate maintenance. GPP funding is being requested to replace the 4511 and 6001 towers; however, until the towers are replaced, extensive maintenance is required to preserve their operability and ensure the safety of personnel required to periodically clean the tower and maintain fans and gearboxes.
(1) Building 4511 is currently unusable and cannot be placed in operation until underground crosstie valves (connecting its basin to the 4510 tower) are replaced. The wooden structure is deteriorating at a rapid rate under dry conditions and becomes increasingly hazardous to maintain. The stagnant basin provides fertile conditions for legionella bacteria. (2) Building 6001 has undergone numerous structural repairs in the last two years and currently is in need of fan control upgrades along with system and basin cleaning to improve bacteria control and operating efficiency.

Mitigating Actions: Towers with structural deficiencies are inspected and repaired as necessary to minimize safety problems for maintenance workers and operators working on or around the towers. Operation of the towers (i.e., starting fans and pumps, water treatment controls) requires routine testing and monitoring by the operators and refrigeration mechanics. These towers are equipped with annunciated alarms in their respective control rooms.

A98D0016 Cooling Tower Replacement - 4511
Cooling Tower 4511 is critically degraded due to age, in extremely poor condition, and cannot be used. GPP funding is being requested to replace 4511.

Mitigating Action: Cooling towers 4510 and 4521 have excess capacity for the projected peak cooling level. However, 4521 would be inadequate for the peak load. Cooling tower 4510 was replaced in FY 1997 and is considered highly reliable. Should either tower fail during peak load periods, a load shedding program would be initiated to reduce the load to below available capacity in the event of the failure of either tower.

C98D0181 Fire Systems Upgrade, ORNL at Y-12 - ERKCL51 (KC-OE)
This fire systems upgrade includes replacing and repairing identified fire protection issues: exit and emergency lights for egress, stairwell fire wall penetration repairs, fire doors replacement or repair, sprinkler systems installed, replacement of ceiling panels to comply with fire protection

standards, etc. All facilities have identified findings in the ORNL LIDS System that currently require addressing.

Mitigating Actions: Exit and emergency lights are checked quarterly and are replaced, if required, using overhead funds as part of the preventive maintenance program. Combustibles in unprotected areas are relocated by building personnel. Fire doors are repaired on building maintenance overhead funding as part of normal building maintenance. All fire protection issues are being evaluated to address the risk to building personnel. Administrative controls are in place, where appropriate, to limit access to areas with fire protection concerns.

S97D0058 Transportation and Packaging Management Facility (KC-GPP)
The new Transportation and Packaging Management (TPM) Organization facility is to be utilized by all TPM employees at ORNL. TPM personnel are located in three facilities: Building 3036 in Isotope Circle houses packaging engineers, chemical operators, and a material assistant; Building 7001 houses primarily traffic and shipping personnel, but also has packaging and Quality Assurance employees; and Building 6026G houses transportation management, packaging engineers, and compliance personnel. Besides improving the effectiveness and efficiency of the entire TPM operation at ORNL, the primary need for the new TPM facility is to relocate TPM personnel in Building 3036 and return Building 3036 to the Chemical Technology Division. Building 3036 contains areas of fixed radiological contamination.

Mitigating Action: TPM follows ES&H standards and procedures in ensuring compliance in relation to fixed-contamination controls. Such controls include, but are not limited to, conducting weekly health physics surveys for operations and office areas, green-tagging operational items (i.e., containers, equipment) before entering the facility, and conducting an annual integrity survey for wearing/thinning paint.

P98D0021 ORNL Safety and Health - OSHA Regulatory Compliance (KC-OE)
LMER's 2000 goal of identifying and correcting all serious OSHA noncompliances (RAC 1s and 2s) and 100% of all previous other-than-serious noncompliances (RAC 3s) has resulted in compliance funding requirements beyond that which current programs can fund. Funding is not available to address large OSHA noncompliance issues that meet the above demands. Therefore, an OSHA Regulatory Compliance proposal is logical and cost effective. It is essential that these needs be identified within the budgeting process. This activity is proposed to upgrade ORNL facilities and programs to achieve compliance with OSHA standards. Continued OSHA-type inspections have been made to identify industrial hygiene and industrial safety noncompliances. The results of these inspections and recent surveys have specifically identified and quantified many noncompliances by sub-part. Additional funding will be required to meet regulatory compliance throughout the Laboratory. In addition, programs will be established to ensure the maintenance of this level of worker safety and health protection.

Mitigating Actions: All serious noncompliances (RAC 1s and 2s) are corrected within 24 hours. All other than serious noncompliances (RAC 3s) are corrected within 90 days, or administrative controls are implemented to ensure that employees are safe. Access to attic areas in the 4500 complex has been restricted to only those personnel who have been trained regarding hazards

associated with unguarded machinery. Overhead funding in the amount of $170K has been allocated for OSHA upgrades in FY 2000.

A99D0064 Hirsch Workstation Encryption System
This project will purchase and install encryption devices for use in encrypting data flow between the Hirsch server and workstation that provide NSA “Type 1” encryption and will work on high-speed fiber optic cable. The ORNL Security Steering Committee has determined that redundant monitoring of the Hirsch Alarm System would be beneficial and would move ORNL one step closer to establishing an on-site Secondary Alarm Station (SAS). In order to achieve this end, a workstation, located at Building 4512, Room 113, must be connected to the server. The communications between these two computers must be encrypted with an NSA “Type 1” encryption.

Mitigating Action: Until this workstation is purchased and installed, the Y-12 Plant will provide the SAS for ORNL.

P98D0003 Nuclear Criticality Safety Program: O 420.1 Upgrade (ERKCL10)
DOE Order O 420.1, Section 4.3, Nuclear Criticality Safety, is incorporated into various ORNL Work Smart Standards. Section 4.3.3.i of that order requires that “ . . . the contractor shall have a program to detect inadvertent accumulations of fissile material.” ORNL does not have a formal site-wide program for monitoring and evaluation of fissionable material accumulation. The purpose of this task is to upgrade the Nuclear Criticality Safety (NCS) Program at ORNL to meet the requirements of DOE Order 420.1 committed to in the ORNL Work Smart Standards.

Mitigating Actions: In most active operations, inadvertent material accumulation potential is addressed by facility- and operation-specific nuclear criticality safety approvals and evaluations (NCSAs and NCSEs). However, ORNL retains some inactive legacy facilities and some currently used process exhaust systems for which potential accumulations have not been formally addressed from an NCS standpoint. A baseline technical evaluation effort is proposed to formally document the NCS rationale for currently active and legacy ORNL facilities associated with fissionable material processing. If administrative efforts outside of ORNL's NCS Program are required to support the NCS rationale (such as surveys performed as part of radiological safety programs), then those activities will be included within the scope for ORNL's periodic NCS Program assessments.

A98D0119 HVAC HCFC 50-Pound Replacements
The scope of this work involves replacing deteriorated air conditioning equipment normally containing more than 50 lb of refrigerant and subject to leaks which exceed the allowable 15% leak rate. Since Class I ozone-depleting refrigerants [chlorofluorocarbons (CFCs)] are being replaced under a separate ADS, this category will be geared to replace older Class II refrigerant systems [hydro chlorofluorocarbons (HCFCs)]. HCFC refrigerants are recovered from the machines as they are replaced and reused in operating units. The job scope includes removal and replacement of old units, electrical starters, and subsequent electrical, piping, and sheet-metal tie-ins. The 7910 chiller is currently unusable due to the ruptured tower water line from 7902.

Mitigating Action: Plant and Equipment Division personnel will continue to repair refrigerant leaks to remain in compliance. The EPA rule for leak repairs (>15%) requires that the leaks be repaired within 30 days of discovery of the leak or 30 days from when the leak should have been discovered. Parts for old and obsolete machines are frequently not off-the-shelf items. If the leaks cannot be repaired within 30 days: (1) a Retirement Plan must be filed with EPA granting a one-year replacement period or (2) the unit must have the refrigerant removed and taken out of service. The 7910 unit is being replaced with GPE funding in FY 2000 (see ADS C97D0125).

VI. FY 2000 ESHQ&I Key Management Issues

The purpose of an ESHQ&I issues management process is to ensure that potentially significant issues are recognized, that summary-level information is communicated to the decision-making level, that expectations are established and assigned for resolution, and that issues are resolved in a complete and timely manner.

The Department of Energy issued DOE P 450.4, *Safety Management System Policy*, which requires both DOE and its contractors to systematically integrate ES&H protection into work planning and execution at all levels. The requirement for implementation of this policy is specified in the DEAR clause. This clause requires that contractors establish and document for DOE approval an ISMS consistent with the policy.

The ISMS is a comprehensive standards-based safety system used to address both work and business processes. ISMS is being institutionalized through DOE policy and contracts. DOE P 450.4 states that "The Department and contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment."
In April 1999, an ISMS Phase I Verification Review was successfully performed at ORNL. The Phase I Verification Review assessed the results of 15 months of activity to build management understanding and support for the ORNL ISMS Program. With successful completion of the Phase I Verification, ORNL undertook the communication and employee involvement initiatives necessary to achieve full Laboratory-wide implementation of the ORNL ISMS Program. During the succeeding months, the following activities were undertaken to support full implementation:

- An Employee Involvement Initiative was established by the ISMS Implementation Committee in May 1999.

- An ISMS Employee Involvement Workshop was conducted in July 1999 to further employee involvement in the ISMS Program.

- An ISMS Employee Involvement Plan was completed in June 1999.

- A National Workshop was sponsored in November 1999 to further the communication of

implementation issues across the DOE complex.

- An ISMS Phase II Readiness Review was initiated in December 1999.
- The outcome of the ORNL Readiness Review was transmitted to DOE in February 2000.

- DOE will perform a Phase II Verification of the ORNL Program in March 2000.

Ongoing assessment of ISMS Program implementation emphasizes the need for:

- further strengthening of the ORNL-level Assessment Program,

- further improvements to the application of ISMS principles to subcontractors,

- better mechanisms to promote sharing Lessons Learned among organizations,

- stronger programs to ensure worker involvement in work planning, adjustment during execution, and evaluation need to be developed,

- better awareness of the ISM approach and implementation by all workers, and

- better systems of metrics to evaluate and improve work performance.

The status of the Key Management Issues will be reported in the FY 2001 ESHQ&I Management Plan to be issued sixty days following the end of FY 2000.

VII. Budget Analysis Support Information

A. Major Planning Assumptions

Planning assumptions are based on direct guidance from the Secretarial Office funding programmatic activities at ORNL. In addition, DOE-ORO funding guidance is followed to ensure consistency of FWPs, ADSs, Capital Equipment Requests, General Plant Project Requests, and Line Item Requests. All overhead planning assumptions are based on a prioritization of risks to the mission of ORNL, personnel safety and health, environmental issues, and public issues. ORNL is dedicated to ensuring that all regulatory requirements are met or exceeded. Reductions in funding may impact some of the requirements of DOE Orders and may severely impact best management practices.

B. Funding Bases

The Secretarial Office responsible for landlord activities at ORNL is the Office of Science (SC), Office of Basic Energy Sciences (BES). Office of Science (SC), Laboratory Infrastructure Division (SC82) is responsible for funding Landlord line item projects. With the exception of activities funded directly by the Office of Environmental Restoration and Waste Management Program (EM), all direct funding allocated to ORNL by SC and other programs as a result of the

ESHQ&I Management Planning efforts is recognized through ADS updates. Where cost is escalated on an ADS included in this plan, a cost escalation rate of approximately 3.2% for labor and materials is used.
ORNL ESHQ&I activities are either direct (Program) funded or funded from a variety of allocable cost pools. ORNL ESHQ&I activities to be direct (Program) funded are identified as either target (funded) or unfunded with the appropriate Resource Structure Code and budget and reporting (B&R) code specified. The allocable cost pools include the site overhead pool (OH), division-specific overhead pools (DA), distributed accounts through service organizations (DI), and burdened accounts supported by a specific division (BC). Each ADS to be funded from these allocable cost pools is identified as either target or unfunded and includes identification of the associated funding pool.

All indirect-funded ORNL ESHQ&I offices (e.g., Office of Environmental Protection) recognize their cost of operation through target ADSs for which costs correspond directly with ORNL overhead budget documents. Unfunded activities which should appropriately be funded through the ORNL overhead budget are recognized as "Supplemental." Direct programmatic funding requests by the ORNL ESHQ&I organizations are submitted through FWPs. The FWP submittals working in concert with the ADS submittals allow both overhead and programmatic organizations to request landlord direct funding for ESHQ&I activities.

ESHQ&I overhead funding targets were developed as part of the FY 2000 ORNL Site overhead budgeting process. Following risk prioritization of activities, recommendations are made to ORNL management for funding of targets and consideration for funding of supplemental requests. ORNL management then allocates available target funding to ESHQ&I organizations for their activities. Overhead funding is reviewed by DOE Site personnel for concurrence. Following adjustments, ESHQ&I organizations are allocated the available funds to support the highest-ranked activities. Adjustments of funded programs are made during the fiscal year based on risk prioritization and management approvals. In addition to the site overhead process, programmatic organizations support intradivisional ESHQ&I activities through a division-specific overhead structure. This funding is controlled by line management to ensure internal compliance to ESHQ&I requirements.

C. FY 2000 ESHQ&I Indirect Budget Summary

ESH&I Overhead (OH) and Space Charge (SC) Indirect	FY 2000 Indirect Budget
Office of Environmental Protection	$5,195K (OH)
CA - Protection of Air Quality	
CW- Protection of Water Quality	
HW- Solid and Hazardous Waste (Oversight Only)	
CS - Control of Toxic Substances	
MR - Environmental Management, Oversight, and Reporting	
PP - Pollution Prevention Oversight	
Health Division	2,814K (OH)
MS - Occupational Medical Services	

Office of Laboratory Protection	13,073K (OH)
EP - Emergency Preparedness	412K (SC)
FP - Fire Protection	(Reflects total OLP budget)

C. FY 2000 ESHQ&I Indirect Budget Summary (cont'd)

ESH&I Overhead (OH) and Space Charge (SC) Indirect	FY 2000 Indirect Budget
Office of Safety and Health Protection & Office of Nuclear Safety IS- Industrial Safety IH - Industrial Safety NS - Nuclear Safety TS - Transportation Safety MO - Management and Oversight	5,300K (OH)
Office of Quality Services MR - Environmental Management, Oversight, and Reporting MO - Safety Management and Oversight	2,143K (OH)
Office of Radiation Protection RP - Radiation Protection	4,151K (OH)
Laboratory Waste Services	2,001K (OH)
Laboratory Logistical Services	5,669K (OH)
OSHA/ES&H Corrective Actions	244K (OH)
Capital Asset Management	809K (SC)
ORNL Integrated Safety Management System	275K (OH)
ORNL Training Integration Office	293K (OH)
Office of Environmental Management	257K (OH)
Plant and Equipment Division	549K (OH) 14,706K (SC)
Low Value Equipment (LVE)	412K (OH)
ORNL Engineering	34K (OH) 260K (SC)
Deactivate Buildings 9207/9211/9220	1,500K (OH)
ORNL Facility Asbestos Survey	200K (SC)
Fire Sprinkler Piping Maintenance	20K (SC)
Total	$60,317K (OH and SC)

NOTE: This submittal has a funded overhead and space charge target of $60,317K. The FY 2000 ESHQ&I Management Plan submittal reported a funded overhead and space charge of $67,676K.

The reduction of $7,359K is reported through the identification of other overhead tasks. This submittal identifies funding based on functional areas. Overhead tasks without ESHQ&I components are not included.

D. ESHQ&I Direct Budget Summary

1. Summary Direct Budget

The following is a listing of planned FY 2000 direct costs and revised funding targets following reconciliation of FWPs and ADSs.

DA Activities[1]		$ 6,290K
DI Activities[2]		14,275K
HFIR Safety[3]		12,196K
KG Program	(ES&H/Both)	1,101K
KG Program	(Infrastructure Only)	0K
KC Program	(ES&H/Both)	4,341K
KC Program	(Infrastructure Only)	3,408K
Total		$41,611K

[1]From the direct target ADSs in the FY 2002 Budget Formulation Plan submittal, DA is designated spending by R&D divisions and programs from their division programmatic funds in support of ES&H needs. These activities included support for internal division personnel with dedicated ES&H roles (e.g., division safety officer) and other expense activities such as the correction of safety shower and eyewash station deficiencies. In addition, direct target funds reported were from expected funding to support projects and activities with an identifiable percentage for ES&H support as well as infrastructure support. Direct unfunded ADSs will be identified in the FY 2001 ES&H Management Plan (Execution). Unfunded items are continually being reviewed to determine if funding allocations need to be adjusted to allow for completion of these activities.

[2]From the direct target ADS C97D0148 in the FY 2002 Budget Formulation Plan submittal, DI is designated as planned distributed cost incurred for ES&H services procured by other ORNL divisions/offices/programs.

[3]ADS E93D0021, “High Flux Isotope Reactor Operation.” This funding recognizes costs for ES&H-related activities which are funded through the Basic Energy Sciences Program activities.

2. Line Item Summary

Net Score	ADS No.	ADS Title	FY 2000	FY 2001
212	C97D0106	Electrical Systems Upgrade	357K	5,543K
176	A99D0018	Fire Protection Systems Upgrade		584K
175	A99D0017	Laboratory Facilities HVAC Upgrade		500K

17	S97D0029	Roofing Replacement		744K	
			Total	$1,101K	$6,627K

3. General Plant Equipment

Net Score	ADS No.	ADS Title	FY 2000	FY 2001
299	A98D0106	Enterprise Gigabit Ethernet Backbone Switches	55K	
297	A99D0128	Logic Analyzer, High-Speed, Deep Memory	102K	
297	A99D0130	Workstation for ORNL's Supercomputing	58K	
297	A99D0127	50-GHZ Digitizing Oscilloscope	58K	
297	A99D0129	33-MHZ to 3-GHZ Timing Generator	68K	
189	C98D0004	Computing Systems & Support Modules SAP	250K	250K
174	A98D0015	Engineering Equipment Replacement	323K	
163	C98D0142	Convert Steam Plant Boilers to Natrl Gas Firing	100K	1,100K
163	A99D0059	Shared Systems Computing Equip for Sep	223K	
163	AA0D0016	Backup Diesel Generator for #6 Boiler	250K	
148	A99D0097	Spincoater, Developer and Inspection Station		129K
148	A99D0099	Photomask Aligner & Exposure System Upgr		421K
148	A99D0102	Dry Chemical Processing Station		
580K				
136	C97D0125	CFC Phaseout - Clean Air Act Compliance	110K	600K
136	A99D0091	EMAIL.CIND System Web Server Upgrades	83K	
134	A99D0033	Primary Substation SF6 Breakers	490K	
134	C98D0121	Replace Fleet Vehicles	100K	
300K				
134	C98D0182	LDRD General Purpose Equipment	167K	
260K				
133	A99D0053	Mailmobile Replacement 4500N 1st Floor	44K	
133	C97D0083	HVAC Upgrades	400K	1,000K
133	A99D0032	Remote Readout Electronic Dosimeter System	55K	
133	AA0D0007	Replace Condensing Units/Evaporators Cafe	82K	
108	C98D0009	LERC Data Acquisition System Upgrade	83K	
108	A99D0028	Whole Body Counting Lab Liq Nitrogen Tank	85K	
107	A99D0100	Tube Furnaces and Process Gas Handling Sta		147K
107	A99D0101	Wet Chemical Etching Station		99K
93	AA0D0036	Cell 1 Window Replacement, Building 3025E		225K
77	A99D0096	ORNL Computer Training Classroom		68K
76	C98D0051	Fluke 5720A Tester		59K
74	A99D0115	Raman Spectrophotometer		
68K				
15	A98D0119	HVAC HCFC 50-Pound Replacements		250K
14	C98D0178	Replace West End De-Aerator B 2510		210K
3	C97D0082	Elevator Upgrades		

1,000K

		Management Reserve	114K	287K
		Total FWP ERKCL01	$3,300K	$7,053K

4. General Plant Projects

Net Score	ADS No.	ADS Title	FY 2000	FY 2001
433	S97D0021	Replace No. 1 Reservoir	2,000K	
311	C98D0120	Environmental and Life Sciences Laboratory	200K	
300	A99D0048	HFIR Cooling Tower Replacement	1,800K	
2,650K				
229	A99D0042	Lambert Quarry Signage and Fencing*		
85K				
202	A99D0020	Lab Expansion-Nanoscience Metrology/Inst	300K	1,000K
199	C97D0071	Fire Protection Systems Upgrade	150K	
915K				
195	A99D0054	Computer Facility Upgrades		1,000K
159	C98D0123	Child Care and Fitness Center		300K
158	S97D0042	HVAC Upgrades		600K
158	A99D0055	Seismic Upgrades, 1506		900K
158	C97D0081	Eyewash, Safety Shower, & Water Sys Upgr		1,900K
		Total FWP ERKCL02	$4,450K	
$9,350K				

*Contingency project for FY 2000.

5. ESHQ&I Field Work Proposals for Expense Funding

Net Score	ADS No.	ADS Title	FY 2000	FY 2001
175	P98D0019	ORNL S&H Bldg. Electrical System Upgrade		1,484K
163	P98D0027	Rehabilitate ORNL Potable/Fire Protection		580K
154	AA0D0042	Unfunded Update Nuclear Facility Drawings		1,739K
118	P99D0013	ORNL Waste Management		554K
74	P98D0007	ORNL H&S Radiological/Toxicological*1		103K
54	C98D0167	Cooling Tower Maintenance*2		229K
37	C98D0181	Fire Systems Upgrade, ORNL at Y-12		400K
30	P98D0006	Baseline Support for Building 2026		1,256K
27	P98D0021	ORNL S&H - OSHA Compliance*3		2,820K
23	P98D0028	Chlorine Removal From Storm Drains		858K
21	C98D0180	Update Precipitator Electrical Controls		112K

19	P98D0003	Nuclear Criticality Upgrade (420.1)	98K
17	A99D0029	Upgrade 480V Breakers, ORNL at Y-12 Facilities	100K
17	P98D0023	Upgrade Backflow Preventer Valve Stations	109K
14	P98D0025	ORNL Surplus/Inactive Facilities Program	4,113K
13	P99D0001	Beryllium Survey	55K
12	P98D0013	Remove Asbestos From Controlled Areas	232K
12	C97D0080	Asbestos Abatement, ORNL at Y-12	960K
10	C97D0079	Wooden Window Repair, ORNL at Y-12	100K
9	S97D0036	Electrical Upgrades	835K
2	P98D0015	Road and Parking Lot Repair*[3]	838K
2	C98D0169	Roof Preventative Maintenance*[3]	500K
1	P98D0009	Asbestos Survey Data Retrieval System	71K

5. ESHQ&I Field Work Proposals for Expense Funding (cont'd)

Net Score	ADS No.	ADS Title	FY 2000	FY 2001
1	S97D0035	Piping Upgrade, ORNL at Y-12		155K
0	S97D0033	Grounds Improvement, ORNL at Y-12		135K
0	S97D0034	Renovate Facilities, ORNL at Y-12		115K
0	S97D0037	Exterior Upgrades, ORNL at Y-12		1,685K
0	S97D0039	Interior Upgrades, ORNL at Y-12		125K
0	P98D0014	Grounds Improvement*[3]		233K
0	P98D0031	Nuclear Criticality Upgrade (DNFSB)*[4]		195K
0	C98D0172	Paint the 7600 Reactor Dome		306K
		Total ESHQ&I FWPs	$0K	$21,095K

*The identified ADSs correspond to FWPs requesting expense funding from SC-BES. Laboratory overhead/space charge funding has been allocated in functional area ADSs to ensure that immediate needs are addressed to protect the health and safety of personnel.

[1]AA0D0020, "F.A.-Laboratory Protection"
[2]AA0D0026, "F.A.-Plant and Equipment"
[3]AA0D0021, "F.A.-Safety and Health Protection Programs" and P98D0147, "OSHA/ES&H Corrective Actions"
[4]AA0D0025, "F.A.-Nuclear Safety Programs"

6. Programmatic Infrastructure Improvements

The following ADS descriptions identify programmatic only requirements at ORNL. Inclusion of these ADSs was requested by SC-82, Laboratory Infrastructure Division. These "infrastructure only" ADSs will ONLY be included in the Office of Science submission.

S97D0043 Laboratory for Comparative and Functional Genomics
The Laboratory for Comparative and Functional Genomics (LCFG) will provide a modern gene function research facility and protection for the genetic mutant mouse lines created during the past 50 years and will support DOE's research programs. Replacing the deteriorated facility at the Y-

12 Weapons Plant on the ORNL Life Sciences Complex will meet these programmatic needs. This line item funding request is for the animal facility.

S97D0046 Spallation Neutron Source
The Spallation Neutron Source is a new experimental facility planned to meet the national need for neutron scattering and related research. The facility will be available to scientists from universities, from industry, and from other federal laboratories. The facility will be equipped with an initial complement of advanced instruments for neutron beam research. The facility will be built around a spallation neutron source. Combining the higher source power with improved experimental facilities will create a useful neutron flux significantly higher than is now available at any facility in the world. There will be beam lines for neutron scattering instruments or other neutron research equipment in the experimental hall. The potential also exists for the development of entirely new lines of scientific research based on the enhanced capabilities that will be available in the facilities.

S97D0047 Advanced Materials Characterization Laboratory
The Advanced Materials Characterization Laboratory is a new facility planned to provide the high-quality environment required to optimize performance of sophisticated characterization equipment essential for the next generation of advanced materials R&D and the centralization of advanced materials structural characterization equipment.

A99D0043 Radioactive Ion Beam Upgrade, ORIC
This project will provide for improvement of the Oak Ridge Isochronous Cyclotron (ORIC). The proposed project will be located in the Holifield Radioactive Ion Beam Facility (HRIBF), Building 6000, at the Oak Ridge National Laboratory.

ORIC has a crucial role in the Holifield Radioactive Ion Beam Facility. ORIC's light-ion primary beams will be used to produce radioactive atoms from fusion reactions in thick targets on a Radioactive Ion Beam (RIB) injector. The ions from the RIB injector will be mass analyzed, accelerated with the 25-MV tandem, and used for the RIB experimental program. The RIB intensity will be proportional to the ORIC light-ion beam intensity, and the number of hours of beam-on-target per year will be impacted by accelerator reliability and component activation.

Major ORIC improvements are needed to reduce activation and radiation exposure to operations personnel and to assure reliable, high-intensity operation. Expected benefits include increased upper limits on ORIC beam intensity, reduced ORIC activation, improved ability to handle activated components consistent with ALARA principles, improved operation efficiency, reduced down time, and reduced operating costs.

C99D0016 DNA Sequencers
Infrastructure for DNA sequencing: 3 ABI 377 Automated DNA Sequencers, MJR Tetrad PCR machine, Robbins Microdispensor, Qiagen Biorobot 9600. The equipment requested will build infrastructure that will promote program development in several divisions: Life Sciences, Environmental Sciences, Chemical Technology, etc.

S97D0004 Extension of Power to Walker Branch Watershed
This project will install several power poles along the roadway and extend existing power lines approximately 1400 ft from Rain Gauge No. 2 to the Walker Branch Throughfall Displacement Experiment (TDE). To allow easier access to the area, the project will also widen and straighten the existing road from Rain Gauge No. 2 to the TDE. To provide phone service to the experiment site, phone lines will be extended from the Katy's Kitchen (Building 0907) area to the TDE along existing power poles.

S97D0006 Renovate Chemical Makeup Area, 2nd Floor Building 4505
The area in the chemical makeup area for the hot cells on the second floor of Building 4505 is about 700 sq ft (14 ft by 50 ft). Pipe chases are available in the area on the south wall and contain the process utilities which are needed for wet-chemical laboratories. Also available on the east end of the area are duct chases which lead to the mechanical equipment room on the third floor of Building 4505. This duct chase can be used for routing ductwork headers from hoods which will be installed in the makeup area. There is sufficient space for location of hood exhaust fans in the equipment room. (There may actually be surplus fans existing in the equipment room.) Work would consist of demolition of wall-mounted cabinets, sinks, counters, etc., in the area, but all material loose and stored in the area will be removed by the operator. Construction work will also include demolition of the existing Virginia metal ceiling with all support structures and existing lighting systems and fixtures. A new drop ceiling and energy-efficient fluorescent lights will be installed. New ductwork would be needed to exhaust any hoods installed as part of this project. This ductwork would be in excess of 100 ft and would be designed to be of the appropriate materials to support chemical research activity. (This would either be stainless steel medium gauge or possibly carbon steel with a coating.) There is presently no heating, ventilation, and air-conditioning (HVAC) supply system for the area. Therefore, it will be necessary to install an HVAC system to supply conditioned air in the summer and heated air in the winter. The heat source may either be supplied as a part of the HVAC unit or installed as a separate steam heater. The size of the unit would probably be 10 tons. This unit may be either single contained or a split unit, according to what environmental control engineers indicate is the best design. Finally, those funds which have not been expended for the HVAC system, piping upgrades, and demolition would be utilized for general decontamination.

S97D0057 Building 3144 Addition
This activity will increase floor space in the Building Technology Center (BTC) by 30% to accommodate two new program areas and improve productivity of the existing building equipment and envelope test facilities. The BTC is the premier national user facility devoted to the development of technologies that improve the energy efficiency and environmental compatibility of residential and commercial buildings. The center is housed in six buildings totaling 20,000 sq ft. Selection of ORNL as the site for new programs in fuel cell and desiccant air conditioning equipment testing requires additional laboratory space, while the increasing number of users of the existing testing capabilities require additional space to improve throughput. This proposal will add 7000 sq ft of space on the north and west faces of Building 3144. To accommodate the expansion, the Roof Thermal Research Apparatus, Structure 3138, will be removed.

The additional space will provide room for a fuel cell test stand, a desiccant air handler loop, and

reestablishment of the domestic refrigeration test lab. It will also improve the throughput of the existing building envelope and equipment climate chambers and test stands by providing assembly space where researchers can prepare instrument experiments while the chambers are occupied with other work. The proposed expansion will also provide space for acquainting BTC users and visitors with the capabilities and accomplishments of the center in the form of permanent installations of outreach materials and exhibits, classroom space, and a library.

S97D0063 Building 7601 and 7603 Local Network Upgrade
Replace the outdated local area network (LAN) in Buildings 7601 and 7603. The new network will be a twisted pair star configuration similar to that used for network services in other areas of ORNL. The work consists of purchasing the necessary wiring and equipment, removing the old LAN, and installing the new LAN and associated switches & hubs.

A98D0087 ORNL Center for Biological Sciences
The ORNL Center for Biological Sciences (CBS) is planned as a modular complex of buildings, equipment, and infrastructure that will house current and future research programs in the areas of functional genomics, structural biology, proteomics, and systems biology. The CBS will also encompass the proposed Center for Structural Molecular Biology, a user facility that will integrate special present and future neutron sources--High Flux Isotope Reactor and Spallation Neutron Source, respectively, with strong programs in mass spectrometry and computational biology at the Laboratory.

A99D0137 Network Upgrade for ORNL Divisions Located at Y-12
Due to the age of the data network infrastructure, an upgrade is needed for ORNL divisions located at Y-12, including the Computing Information and Networking (CIND), Engineering Technology (ETD), and Fusion Energy (FED). The proposed upgrade comprises of three activities: (1) replacement of the aged fiber optic cable connecting 9204-1 to the data network; (2) replacement of old FDDI concentrators, FDDI-to-ethernet bridges, and aging ethernet coaxial repeaters with state-of-the art ethernet twisted-pair switching hub technology; and (3) replacement of outdated coaxial cable technology with the LMER recommended twisted-pair technology.

The majority of the current network infrastructure was installed during 1992. During that period, existing fiber optic cable from 9201-2 to 9204-1 was utilized to reduce implementation costs. This cable was installed during 1980-1982 in support of Fusion Energy's ATF activities located in 9204-1. According to Belden, the manufacturer of this fiber optic cable, the specific life expectancy for this cable is rated between 12 and 15 years. Typically, the cable is expected to become brittle and break due to a fatigue stress. Since this cable is already significantly beyond the upper limits of its expected life span, failure in the near future is probable. When this cable fails, it will sever access to the Internet and e-mail for all ORNL staff located in 9204-1 (approximately one-third of ETD's technical staff).

In 1992, FDDI concentrators and FDDI-to-ethernet bridges were installed. With this system, ethernet access is supplied from the FDDI-to-ethernet bridges to ethernet repeaters through RG58

coaxial cable, a shared bus 10 mega-bytes per second (Mbs) technology. Desktop systems, computational workstations, and systems used for experimental data acquisition are connected in groups, called segments, with each segment connected to the main ethernet line through a repeater. The concentrators, ethernet bridges, and repeaters are old, employ antiquated technology and are subject to frequent failures. Each failure severs network access and e-mail for entire groups: anywhere from 20 or 30 users to 100 or more, depending on which component fails. This equipment needs to be replaced, not with like components, but rather with current technology.

The RG58 coax shared bus technology is antiquated, and can easily disable many concurrent users who share an ethernet segment. Failure of a single ethernet device on a shared ethernet segment will fail and affect the entire segment, typically impacting 20 - 30 users. Since 1992, LMER has adopted the Standard Wiring Plan, which recommends the use of twisted-pair media for the purpose of data networking. The installation of twisted-pair media would reduce the impact of failures on users using RG58 coax media, and provide the staff member the ability to have 10/100 dedicated Mbs to their systems. This is a one to two orders of magnitude improvement in the speed provided by the existing technology to a typical user. In addition, twisted-pair switched hubs are the recommended technology to realize maximum performance and problem isolation. Installation of switched hubs removes the need for the aforementioned FDDI concentrators, bridges and repeaters, thus solving the problem of old and unreliable equipment.

A99D0146 HFIR HB-4 Beam Line
This proposed project will be located at the HFIR facility at the Oak Ridge National Laboratory. It will design, fabricate, and install neutron guides, mirrors, and shielding for four new beam lines. The new beam lines will be installed following the beryllium reflector changeout planned to begin in FY 2000.

The beam lines will be optimized for use with the new HB-4 beam tube and cold neutron source currently under design and construction. The resulting brighter beams will make it possible to provide a higher flux of neutrons on the experimental samples that are placed in the beams for study. All aspects of the design will be subject to appropriate safety analysis and controlled by a graded quality assurance program. Startup will be preceded by an appropriate readiness assessment.

A99D0147 Neutron Science Support Building Extension
The proposed site for the Neutron Science Support Building (NSSB) Extension is located south of the HFIR (Building 7900) and east of 7961 collection tanks at Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The NSSB Extension [Small Angle Neutron Scattering (SANS) Facility] will be an 80-ft by 80-ft extension to the south wall of the NSSB, Building 7970.

AA0D0044 Building Science Research Facility
This activity will provide space for expanded and new capability to conduct building sciences research at ORNL. ORNL already has one of the premier buildings research centers in the country. However, test capabilities at the Buildings Technology Center have been stretched to the

point that changes can be accommodated only by the elimination of other existing capabilities. In many cases the removed apparatus has significant technological and economic life remaining, but facility upgrading has a higher priority. Also, crowding of facilities and an incessant stream of visitors are beginning to impact staff responsiveness and productivity.

New building products and systems will require new testing procedures and protocols which will in turn require new testing equipment and capabilities. These will result from:

-- the development of new materials and products driven by new criteria, affordability, and sustainability;
-- the need to understand and optimize systems integration and interaction;
-- the need to test additional physical parameters for environmental impact, future code compliance, and other issues;
-- the need to conduct life cycle assessment of products to establish environmental impact;
-- the need to expand climatic testing beyond those found solely in the United States to permit our products and systems to compete successfully abroad; and
-- the requirement to understand long-term performance through accelerated life-cycle testing.

The new facility will provide facilities for about 60 professionals and their support staff. There are eight interior laboratories for material and component testing and outdoor space for several model building test sites. Four conference rooms and a video conference center will accommodate the heavy requirement for team research, for guest working sessions, and for visitor interactions. The facility will be outside the ORNL security perimeter to facilitate strong industry interaction. (Proposed location: The north side of Bethel Valley Road)

E. Impact of Potential Budget Reductions for ESH&Q Tasks

Significant reductions in funding for labor, materials, and services affecting ORNL ESHQ&I programs have occurred during the past several years. Further reductions are likely and could result in the elimination or reduction in scope of various ES&H programs and activities. The most significant impacts will likely be on the tasks associated with the lowest ranked activities and programs to which target overhead funding has been allocated in the plan.

It is anticipated that potential initial budget reductions would likely result in deferral or reduction in the scope of activities. More significant budget reductions would begin to affect core ES&H programs (indirect funded) necessary to accomplish ORNL’s missions and maintain current levels of regulatory compliance.

The following ESH&Q tasks received low risk score ranks of funded indirect projects which could be impacted:

Environmental Program Management Oversight - Activities in this function provide regulatory analysis and interpretation of environmental issues. They further provide for the development and maintenance of environmental information systems.

Data Transfer to Oak Ridge Operations Office Environmental Information System (OREIS) Database - Activities in this function compile and prepare environmental sampling data for

transfer to the OREIS database.

Intercomparison Studies - These programs have been implemented as a recommendation of ANSI N13.30, “Performance Criteria for Radiobioassay”: in vitro urinalysis program, the external QC program for in vitro bioassay (urinalysis); in vitro fecal program, the external QC program for in vitro bioassay (fecal analysis); in vivo program, the external QC program for in vivo bioassay.

Assessment Program Functional Support - This activity facilitates implementation of the Laboratory Assessment Program Plan through the functional disciplines embodied in three groups: the Technical Audit Group, the Corrective Action Support Staff, and the Audit Logistics Group.
ORNL Assessment Program - This activity provides for the development of a coordinated and integrated system of continuous improvement that encompasses all activities at ORNL.

ORNL Audit Center - This activity facilitates implementation of the Laboratory Assessment Program Plan through operation of an audit center. All logistics details pertaining to support of an external or internal assessment team are within the purview of the audit center manager.

VIII. Conclusions

ORNL strives for ESHQ&I excellence by properly planning and performing work activities so that ESHQ&I considerations are integrally a part of the R&D activities and supporting operations. Involvement of workers in a positive environment ensures adequate input for work planning, hazard recognition and minimization, development of clear lines of ownership and responsibility, and establishment of a balanced understanding of goals and requirements for the allocation of limited resources.

This plan reflects activities pursued at ORNL to identify and balance on-going activities against requirements. The ISMS is structured to systematically integrate ESH&Q objectives and infrastructure needs into management and work practices.